

What is claimed:

1. A method of determining whether a subject is at risk for developing atherosclerosis-associated plaque rupture or myocardial infarction comprising:
 - a) measuring the level of ApoCI protein in a biological sample from the subject; and
 - b) comparing the level of ApoCI protein in the biological sample from the subject to the level of ApoCI protein from a control,wherein an increased level of ApoCI protein as compared to the control indicates that the subject is at risk for developing atherosclerosis-associated plaque rupture or myocardial infarction.
2. The method of claim 1, wherein the ApoCI protein is associated with elevated large HDL levels.
3. The method of claim 2, wherein the elevated large HDL is ApoCI-enriched.
4. The method of any one of claims 1-3, wherein the level of LDL in the sample is normal.
5. The method of any one of claims 1-4, wherein the subject is female.
6. The method of any one of claims 1-5, wherein the subject has been previously diagnosed with atherosclerosis.
7. The method of any one of claims 1-5, wherein the subject has not been previously diagnosed with atherosclerosis.
8. The method of any of claims 1-7, wherein the biological sample is selected from blood, serum, and plasma.

9. The method of any one of claims 1-5 or 8, wherein the subject is an infant.

10. The method of claim 9, wherein the infant had low birthweight.

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11. The method of any one of claims 9 or 10, wherein the biological sample is taken from the infant's umbilical cord.

12. The method of any one of claims 1-11, wherein the level of ApoCI 10 protein is detected by a method selected from the group consisting of Western blot, ELISA, RIA, MALDI-TOF, and MRI.

13. The method of any one of claims 1-11, wherein the level of ApoCI protein is detected by measuring ApoCI activity.

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14. The method of claim 13, wherein measuring ApoCI activity comprises determining the ability of ApoCI to activate N-SMase activity.

20 15. The method of claim 14, wherein N-SMase activity is measured in vitro.

16. The method of claim 13, wherein measuring ApoCI activity comprises determining the ability of ApoCI to induce apoptosis in a cell.

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17. A method of identifying a compound useful for the treatment or prevention of atherosclerosis, plaque rupture, apoptosis, or myocardial infarction comprising:

- a) contacting ApoCI polypeptide with a test compound; and
- b) determining whether the test compound binds to ApoCI,

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wherein a test compound that binds to ApoCI is identified as a compound useful for the treatment or prevention of atherosclerosis, plaque rupture, apoptosis, or myocardial infarction.

18. A method of identifying a compound useful for the treatment or prevention of atherosclerosis, plaque rupture, apoptosis, or myocardial infarction comprising:

- a) contacting ApoCI polypeptide with a test compound; and
- b) determining whether the test compound inhibits ApoCI activity, wherein a test compound that inhibits ApoCI activity is identified as a compound useful for the treatment or prevention of atherosclerosis, plaque rupture, apoptosis, or myocardial infarction.

10 19. The method of claim 18, wherein ApoCI activity is measured by measuring the ability of ApoCI to activate N-SMase activity.

15 20. The method of claim 18, wherein ApoCI activity is measured by measuring the ability of ApoCI to inhibit cell surface expression of SR-BI or ABCA1.

20 21. The method of claim 18, wherein ApoCI activity is measured by measuring the ability of ApoCI to induce apoptosis in a cell.

25 22. The method of any one of claims 16 or 21, wherein the cell is selected from the group consisting of: a vascular smooth muscle cell, an endothelial cell, a macrophage, an epithelial cell, a fibroblast, and a T lymphocyte.

25 23. The method of claim 22, wherein the cell is an aortic smooth muscle cell.

30 24. The method of any one of claims 16, 21, 22, or 23, wherein apoptosis is measured using a DNA-laddering assay.

30 25. The method of any one of claims 16, 21, 22, or 23, wherein apoptosis is measured using fluorescence microscopy.

26. The method of any one of claims 16, 21, 22, or 23, wherein apoptosis is measured by measuring cytochrome c release.

27. The method of any one of claims 16, 21, 22, or 23, wherein apoptosis is measured by measuring caspase activation.

5 28. The method of claim 27, wherein the caspase is caspase-3.

29. A method of identifying a compound useful for the treatment or prevention of atherosclerosis, plaque rupture, apoptosis, or myocardial infarction comprising:

10 a) contacting a cell that expresses ApoCI with a test compound; and

b) determining whether the test compound inhibits ApoCI expression,

15 wherein a test compound that inhibits ApoCI expression is identified as a compound useful for the treatment or prevention of atherosclerosis, plaque rupture, apoptosis, or myocardial infarction.

20 30. The method of claim 29, wherein ApoCI expression is measured by measuring the level of ApoCI mRNA.

25 31. The method of claim 30, wherein ApoCI mRNA is measured using a method selected from the group consisting of: Northern blotting, primer extension, nuclease protection, and RT-PCR.

32. The method of claim 29, wherein ApoCI expression is measured by measuring the level of ApoCI polypeptide.

33. The method of claim 32, wherein the ApoCI polypeptide is secreted into the culture medium.

30 34. The method of any one of claims 29-33, wherein the cell is a liver cell.

35. The method of any one of claims 32-34, wherein the ApoCI polypeptide is measured using a method selected from the group consisting of: Western blotting, ELISA, RIA, and MALDI-TOF.

5 36. The method of any one of claims 17-35, wherein the compound increases HDL metabolism.

10 37. A method of treating a subject suffering from or at risk for developing atherosclerosis, plaque rupture, apoptosis, or myocardial infarction comprising administering to the subject a therapeutically effective amount of an ApoCI inhibitor.

38. A method of increasing HDL metabolism in a subject, comprising administering to the subject a therapeutically effective amount of an ApoCI inhibitor.